

**METHOD AND APPARATUS USING A CIRCUIT MODEL  
TO EVALUATE CELL/BATTERY PARAMETERS**

ABSTRACT OF THE DISCLOSURE

Testing apparatus senses the time-varying  
5 electrical response of an electrochemical cell/battery  
to time-varying electrical excitation. The cell/battery  
may, or may not, be in service. Computation circuitry  
responsive to the time-varying electrical response  
evaluates elements of a unique circuit model  
10 representation of the cell/battery. Performance  
parameters and physical parameters are computed from  
these element values. Computed performance parameters  
include, but are not limited to, "total storage  
capacity", "absolute stored charge", "state-of-charge",  
15 "absolute cranking current", "fully charged cranking  
current", and "state-of-health". Computed physical  
parameters include, but are not limited to, "exchange  
current", "maximum exchange current", "charge transfer  
conductance", "maximum charge transfer conductance",  
20 "double layer capacitance", and "maximum double layer  
capacitance". Computed parameters are either displayed  
to the user, employed to initiate an alarm, or used to  
control a process such as charging the cell/battery.

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